

Under Five Child Mortality: Experience from Bangladesh

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ABSTRACT

Under five mortality rates is a key indicator for several development policies, targets and programs. However, relevant source of data on causes of death are not available in developing countries, including Bangladesh. Because sometimes the information is hidden with the various causes of risk. The main purpose of this study is to find out some different cases of child mortality with the various causes. The paper reveals that several characteristics - socioeconomic, demographic, health related disease and non-disease - are affecting child mortality.

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**INTRODUCTION**

Bangladesh is a large and heavily densely populated country in South Asia. The current population of Bangladesh is 168.07 million. This makes Bangladesh the 8th most populous country in the world (BDRC, 2019). Bangladesh located 1, 47,680 square kilometers land area with limited resources. Her per capita income is US \$ 1516 (WB, 2017) and the life expectancy at birth for both sexes is currently at 72.7 years of age. Her vast manpower (168.07 millions) with 72.76% literacy rates (male 77%, female 70%) establishes a forthcoming resource for development (UNESCO 2018). Since independence 1971, the Government of Bangladesh (GOB) has been followed a policy of health care system. Bangladesh achieved in overall the health condition of mothers and children.

About 2500 children in this age group die every day. Under 5 child mortality rates reduce in regional and globally both but most of the under 5 children dies till now malnutrition in before and after birth and lack of awareness about food habits, mothers prenatal care and pre-judgment. In Bangladesh, the under-five mortality rate at the beginning of the MDG period was 133 per 1000 live births (ICDDR, B 2007), which currently is 46 per 1000 live births (BDHS 2014). This study takes "under-five" mortality in Bangladesh as an event which may happen due to two types; disease (child died either from neonatal tetanus, measles, diarrhea, meningitis or neonatal jaundice) or non-disease (child died either by congenital abnormalities, birth asphyxia, drowning, birth injury, respiratory distress, premature birth, serious infection,

malnutrition or other causes) and adequate nutrition and clean water and sanitation.

Child Mortality

Child mortality, also known as under-5 mortality or child death, refers to the death of infant and children under the age of five or between the ages of one month to four years. Many child deaths go unreported for a variety of reasons, including lack of death registration and lack of data on child migrants. Without accurate data on child deaths, we cannot fully discover and fight the greatest risks to a child's life.

Reduction of child mortality is reflected in several of the United Nations' Sustainable Development Goals. Rapid progress has resulted in a significant decline in preventable child deaths since 1990, with the global under-5 mortality rate declining by over half between 1990 and 2016. While in 1990, 12.6 million children under age five died, in 2016 that number fell to

5.6 million children. On the other hand, in spite of advances, there are still 15,000 under-five deaths per day from largely preventable causes. About 80% of these occur in sub-Saharan Africa and South Asia, and just 6 countries account for half of all under-five deaths: India, Nigeria, Pakistan, the Democratic Republic of the Congo, Ethiopia and China. 45% of these children died during the first 28 days of life. According to the World Bank and the World Health Organization (2018) the under-five mortality rate for the world is 40.8 deaths. 5.6 million children under age five died in 2016, 15,000 every day.

Causes:

The leading causes of death among children under 5 in 2017 were preterm birth complications, acute respiratory infections, pneumonia, birth asphyxia, interpartum-related complications, inborn differences, improving access to water, sanitation, and hygiene and providing vaccinations and diarrhea. Neonatal deaths accounted for 47% of under-five deaths in 2017.

The leading causes of death of children under five include:

Causes of diseases	% of death
➤ Preterm birth complications	18%
➤ Pneumonia	16%
➤ Interpartum-related events	12%
➤ Neonatal sepsis	7%
➤ Diarrhea	8%
➤ Malaria	5%
➤ Malnutrition and Under nutrition	45%
➤ Traffic injuries	8%

Child mortality isn't only caused by infection and disorder, it is also caused by premature birth, birth defect, new born infection, birth complication, birth asphyxia and disease like pneumonia, malaria, sepsis, and diarrhea (NHS Inform, n.d.). In less developed countries, malnutrition is the main source of child mortality. Pneumonia, diarrhea and malaria together are the cause of 1 out of every 3 child deaths before the age of 5 and nearly half of under-five deaths globally are attributable to under nutrition (Dictionary, n.d.). Unsafe water, poor hygiene practices and inadequate sanitation are not only the causes of the continued high incidence of diarrheal diseases, they are a significant contributing factor in under-five mortality caused by pneumonia, neonatal disorders and under nutrition; more than 800 children die every day from diarrheal diseases linked to poor hygiene (Medicinenet, n.d.).

Who is most at risk?

Children under the age of 5 - Significantly global progress has been made in reducing child deaths since 1990. The total number of under-5 deaths worldwide has declined from 12.6 million in 1990 to 5.4 million in 2017 – 15000 every day compared with 34 000 in 1990. Since 1990, the global under-5 mortality rate has dropped by 58%, from 93 deaths per 1 000 live births in 1990 to 39 in 2017.

Although the world as a whole has been accelerating progress in reducing the under-5 mortality rate, disparities exist in under-5 mortality across regions and countries. More than half of under- 5 child deaths are due to diseases that are preventable and treatable through simple, affordable interventions (Merriam-Webster). Strengthening health systems to provide such interventions to all children will save many young lives. Malnourished children, particularly those with severe acute malnutrition, have a higher risk of death from common childhood illness such as diarrhea, pneumonia, and malaria. Nutrition-related factors contribute to about 45% of deaths in children under-5 years of age (Dictionary, n.d.).

Literature Review

The review of different literatures on under-five child mortality shows that a number of socio- economic and demographic factors are influencing child mortality. Caldwell et al. (2000), Debpuur et al. (2005), Hosseinpoor et al. (2005), Madise and Diamond (1995) have found a significant

relationship between various socioeconomic factors, demographic factors and infant child mortality by analyzing various countries' survey and census data. They found that gross domestic product, female education, and other factors explained practically all variations in child mortality across countries. The situation with regard to Goal-4 in the South-East Asian sub region is mixed. Near five million children across the Asia-Pacific region still die every year before reaching the age of five, which represents half of all under-five deaths in the world (ESCAP, UNDP and ADB, 2005; UNICEF, 2005a). Md. Israt Rayhan and M. Sekander Hayat khan (2006) had done a research, titled "Factors Causing Malnutrition among under Five Children in Bangladesh" where they find that 45% of the children under age five were suffering chronic malnutrition, 10.5% were acutely malnourished and 48% had under-weight and other non-disease problem. Mondal et al. Factors Influencing Infant and Child Mortality: A Case Study of Rajshahi District, Bangladesh (2009) have shown that, the risk of child mortality decreased when mother's education increased; raise more hygienic sanitation facilities and better access to safe treatment places as prenatal and birth delivery with the help of proper health system.

Tasnuva Tabassum and Wasimul Bari (2014) has done a research work titled "COMPETING RISKS ANALYSIS OF UNDER-FIVE CHILD MORTALITY IN BANGLADESH" where they find that mother's primary and secondary education, child birth order, mothers aged greater than 30 years at the time of giving birth, home as a place of child delivery are played significant role in decreasing under five child mortality. Bangladesh Demographic Health Survey (2014) found that in Bangladesh between 1989 and 2014, under-five mortality rate reduced by two-third, from 133 to 46 deaths per thousand live births. Sabrina Naz, Andrew Page and Kingsley Emwinyore Agho (2015) was published an article they found that house air pollution was not strongly associated with overall neonatal ($OR = 1.49$, 95% CI = 1.01 – 2.22, $p = 0.043$), infant ($OR = 1.27$, 95% CI = 0.91 – 1.77, $p = 0.157$) or under-five mortality ($OR = 1.14$, 95% CI = 0.83 – 1.55, $p = 0.422$) from this context it is fully understood that mobility decreasing under-five mortality. Shahnaz Nilima (2017) conducted study where she found that the children whose mothers live in Barisal and Sylhet have 60% lower and 52% higher rate of under-five mortality, respectively compared to the children who belong to Dhaka and these results have been found significant at 5% and 10%. The heading of an article "**Under-5 mortality rate falls sharply in Bangladesh**" published by UNICEF (2017), where they informed that Under-five mortality rate in Bangladesh is 32 per 1,000 live births, according to new mortality estimates released by UNICEF, WHO, the UN Population Division, and the World Bank Group. It has significantly gone down from 532,000 deaths in 1990 to 100,000 in 2017.

Levels and Trends in Child Mortality Report 2018 released by UNICEF, World Bank, World Health Organization and UN (2018) and there exposes that the world has made considerable progress in reducing child mortality since 1990, but also stresses shows that a child under 15 dies every five seconds around the world. The under-five mortality rate has declined by 58 per cent since 1990, and the number of under-five deaths dropped from 12.6 million in 1990 to 5.4 million in 2017.

Methodology

The data of this study is mostly covered by Bangladesh Demographic Health Survey-2014, UNICEF global database and others previous & current reports published at national and international levels related to under five age child mortality issues in the context of globally and Bangladesh and. It is mentionable that, apart from the local perspective, the study also focuses on various reports conducted by the different international organizations or by individual researchers in recent times from global perspectives.

Objective

The objectives of this paper is to document the experience of Bangladesh that it has experienced while trying to achieve the MDG target 4: reduce under 5 mortality rate. However, the paper also shows a probable way out for Bangladesh to overcome the challenges and then reach the target of SDG related to child mortality.

Result and Discussion

In Bangladesh various causes of death under 5 mortality. UNICEF-supported national study in 2004 shown that the leading cause of death among children aged 1 to 4 years is drowning, followed by pneumonia, malnutrition, and diarrhea. This statistic shows the under-five child mortality rate in Bangladesh from 2005 to 2016. In 2014, the under-five child mortality rate in Bangladesh was approximately 38.6 deaths per one thousand live births. The under-5 mortality rate fell from 85 to 29 between 2000 and 2017. The report also states that Bangladesh is one of the few developing countries on track to meet some targets for the Millennium Development Goals (MDGs), particularly those relating to nutrition, diarrhea, universal primary education and reducing under-five mortality.

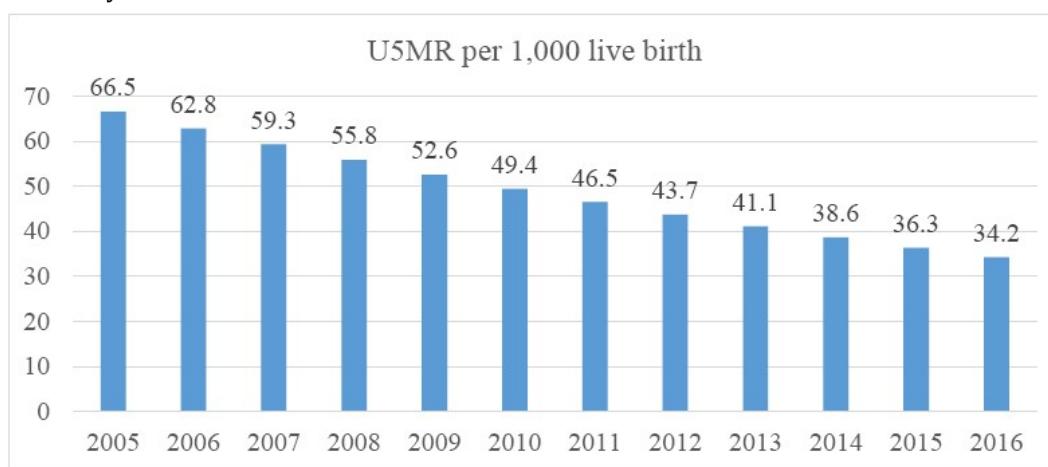


Figure 1. Trends of Under-Five Mortality Rate in Bangladesh from 2005 to 2016 (Following Statista 2019)

Level of Childhood Mortality

Data from the BDHS 2014 shows that under-5 mortality in the five years preceding the survey is 46 per 1,000 live births (Table 1). Bangladesh has achieved its Millennium Development Goal 4 target for under five mortality (48 per 1000 births by 2015) in advance. The infant mortality rate is 38 deaths per 1,000 live births, and the child mortality rate is 8 per 1,000 children. It is also notable that deaths in the neonatal period account for 61 percent of all under- 5 deaths.

Table-1: Early childhood mortality rates Neonatal, post neonatal, infant, child, and under-5 mortality rates for five-year periods preceding the survey, Bangladesh (BDHS) 2014

Years Preceding the survey	Neonatal Mortality (NN)	Post Neonatal Mortality (PNN)	Infant Mortality (1q0)	Child Mortality (4q1)	Under-5 Mortality (5q0)
0-4	28	10	38	8	46
5-9	36	14	49	13	61
10-14	36	21	57	16	72

Since 1993-1994, the DHS surveys in Bangladesh have obtained childhood mortality rates for the five-year period preceding the survey. Over the last two decades, the data confirm a steady downward trend in childhood mortality (Figure 2). Between the 1989-1993 and 2010-2014 periods, the 65 percent decline in under-5 mortality over the same period. As a consequence of this rapid rate of decline, Bangladesh has achieved its MDG 4 target for under-5 mortality of 48 deaths per 1,000 live births by 2015 (BDHS 2014)

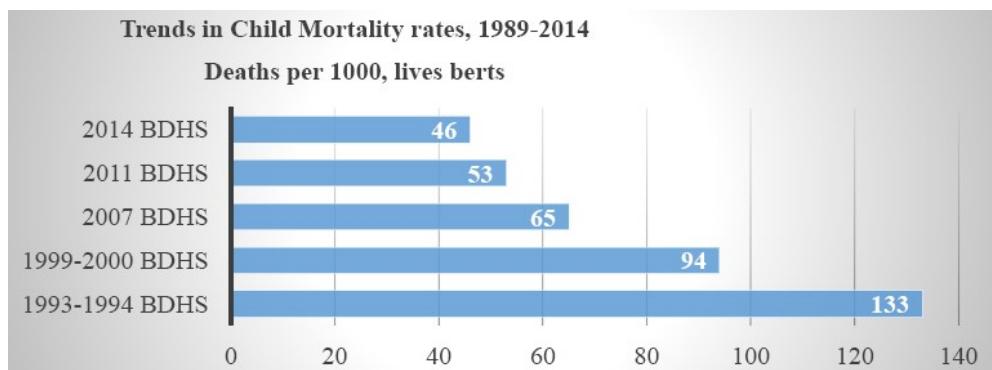


Figure 2: Child Mortality rates, 1989-2014 (BDHS-2014)

1. Experience of Child Mortality in Bangladesh

There are many cases related in child birth like; **Mother's Age at Birth, Mother's Education, Wealth Index", Place of Delivery and Birth Order.** In many several reports found that if mother age is less than 20 years, they are 2.568 more times higher risk of death due to disease than their counterparts having older mothers (Age-Wekepedia, n.d.). Aged mother can spend much time behind each child for proper care.

Mother's education plays vital role to reduce child mortality. Under 5 mortalities from both due to disease and non-disease, it is noticeable that higher educated women are lower mortality rate than low or un-educated. Educated mother can take proper decision regarding child-birth. The risk of mortality due to disease of children having mothers with primary and secondary education are 62% and 63% less than that of children having mothers with no education (htt), respectively. Mother's education also takes an initiative child receiving all basic vaccinations by age 12 months.

Birth order is also another important role in influencing child mortality. If the first child with a lower mortality rate due to disease than the child who is second one or later in birth line. The reason may be that the parents pay an extra attention to the mother and new born nutrition when they expect their first child. They are going to regular prenatal and postnatal checkup, which is helping reduce mortality diseases among first and also for second or later child in birth line. Maternal care and child nutrition also differ in the case of the first child than the second child.

Place of delivery one of the important roles for the both baby and mother. Basically, it is reflected that child delivered in hospitals live a longer life than those delivered in home since hospitals are more hygienic and secured place for delivery (Childbirth, n.d.). It is really interesting that, both the conflicting due to disease and non-disease reveals that the children born in home tend to survive for a longer time than the children born in hospitals, clinics or places other than home. According to BDHS (2014) 62% delivered at home; because of poor wealth. In Bangladesh especially in rural area child deliver at home as a result child birth registered is not confirmed, child nutrition, proper treatment of neonatal care and vaccination for child is not ensure. In Bangladesh birth registration rates are very low due to the absence of effective and functioning birth registration systems. In Bangladesh and Zambia, UNICEF estimates that only 10% of births are registered.

To reduce child morbidity and mortality the government of Bangladesh initiated the **National Immunization Program** against six vaccine-preventable diseases (tuberculosis; diphtheria, pertussis, and tetanus; polio; and measles) in 1979. Vaccinations are most effective when given at the proper age. So, it is recommended that children complete the schedule of immunizations during their first year of life (i.e., by 12 months of age). Overall, 78% of children age 12-23 months had received all the mentioned vaccinations before their first birthday (BDHS 2014). It is really appreciated that almost all divisions were completed their vaccination program successfully every year. As per BDHS 2014 report the highest level of coverage is seen in Rangpur 90% and the lowest in Sylhet 61%. As expected, mother's education is positively connected with children's possibility of presence fully vaccinated. For example, 95% of children mothers completed secondary or higher educated are fully vaccinated, and 74% of children mothers have no education.

Diarrhea- Getting dehydration from diarrhea is an important cause of childhood mortality. During diarrhea, the child to give a solution prepared either by mixing water with the salts in a commercially prepared oral rehydration packet (ORS)-also called khabar or packet saline in Bangladesh- or by making a homemade solution of sugar, salt, and water, also called labon gur. Oral rehydration therapy has a long history of use in Bangladesh because it was developed more than four decades ago by the International Center for Diarrheal Disease Research, Bangladesh (ICDDR, B). Overall, 36 % of children under age 5 with diarrhea were taken to a health facility or provider for treatment. 8 in 10 children with diarrhea were given oral rehydration therapy (ORT), that is, either a solution made from oral rehydration salt (ORS) packets or a homemade sugar-salt solution, and 38 percent received both ORT and zinc. (BDHS 2014).

Gender- There are many several previous analyses revealed that the level of under 5 mortalities in rural Bangladesh has reduced significantly during the last two decades. The negative relationship between household socioeconomic status and mother's education with childhood mortality has been consistent with findings reported earlier in Bangladesh. Due to the lack of nutrients of the girl children and the rural vulnerability due to poor prejudice, they were not given nutritious food, resulting in higher female children under 5 mortality rates. Though population living below poverty line in rural Bangladesh had decreased substantially from 52.3% in 2000 to 35.2% in 2010, nevertheless the socioeconomic inequality in under-five mortality persisted.

Drowning- By comparison, among children between 5 and 14 years of age, injuries become a more prominent cause of death, especially from drowning and road traffic. In rural and urban children playing in the inflated rivers, canals, ponds, drain, ditches and other water bodies die frequently. The termed drowning 'a silent killer' of children, aged between one year and 18 years in the country. A UNICEF study shows that more than 18,000 children, mostly 1- 4 years of age, die each year from drowning in Bangladesh and an average 50 children drown a day in this country. 'Children in Bangladesh, who cannot swim, are 4.5 times more vulnerable to drowning than those who can swim in this riverine country,' the study revealed.

WASH- Till now safe drinking water and hygienic sanitation uses are not quite available in Bangladesh. That's why children face various risks with contaminated diseases. Over 45,000 under-five children die every year in Bangladesh from diarrhea caused by contaminated water, says a report of World Health Organization. Water contaminated with faces puts people at risk of contracting cholera, dysentery, typhoid and polio, says the report titled "UN Water - Global Analysis and Assessment of Sanitation and Drinking-Water 2017". According to the WHO report, 42% urban population in Bangladesh don't use improved sanitation facilities, while the figure is 38% for rural population. Besides, 13% people don't have improved drinking water sources and contaminated drinking water causes more than 5,00,000 diarrheal deaths each year globally. According to the BBS (2017) they analysis that in rural 93.3% have improve sources of drinking water whether in urban only 72% have improved sources of

drinking water (Table- 2). In Table-3 sanitation facility in rural is very poor only 65.9% and 4% who have no sanitation facility. In urban 86.1% have sanitation facility.

Table-2: Percentage Distribution of Household by source of Drinking Water by Locality (BBS-2017)

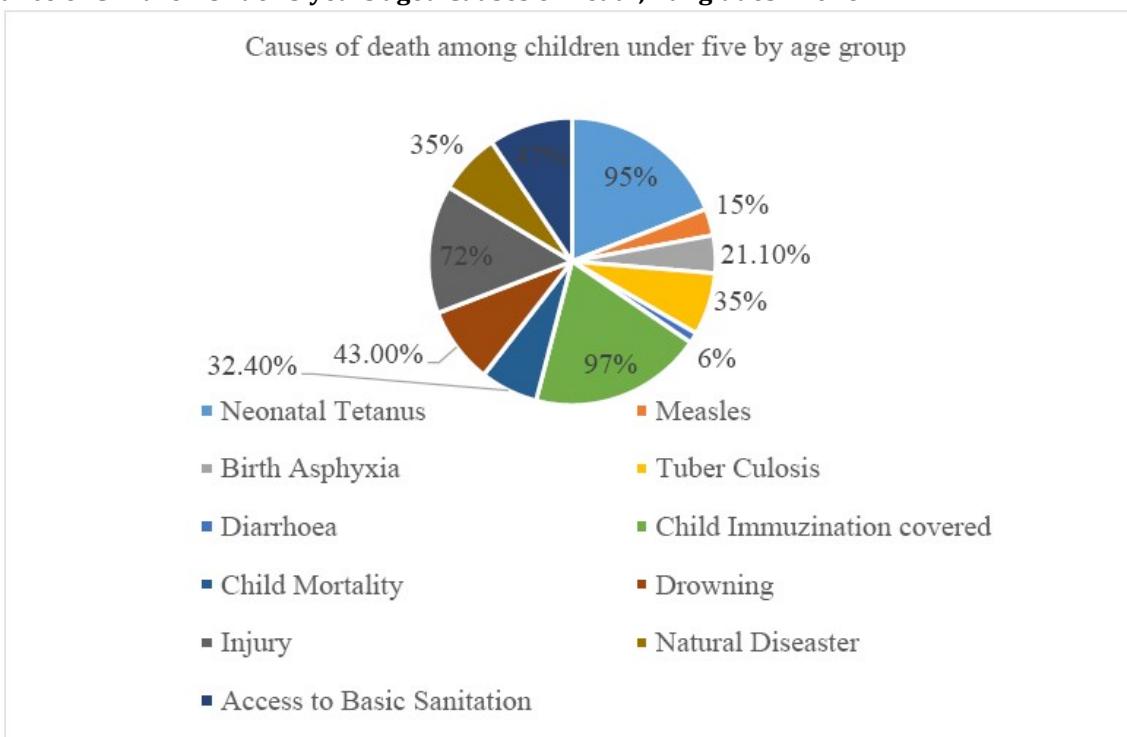
Year	Locality	Tap	Tube well	Well	Pond	Canal/River	Others
2016	Rural	3.9	93.3	0.7	1.3	0.2	0.6
	Urban	27.1	72.0	0.3	0.0	0.1	0.5

Table-3: Percentage Distribution of Household by Toilet Facility and Locality (BBS-2017)

Year	Locality	Sanitary	Others	None
2016	Rural	65.9	30.2	4.0
	Urban	86.1	12.8	1.1

Mobile Phone reduce child mortality -As the lack of knowledge, information and health services is considered one of the underlying causes of child mortality (under five and infant mortality) (UNICEF, 2009:15), access to the mobile phone can play an essential role in reducing child mortality. In Bangladesh, mobile birth notification system "mobiles for health" was launched for the purpose of contacting health units to call for midwives in case working ladies need them. Applying this system resulted in the fact that the number of births under the supervision of specialists reached about 89%. Beforehand, about 90% of births used to take place outside hospitals (Brownlee, 2012). From this result imply that mobile phone is an important contributor and can reduce child mortality an emergency.

2. At a Glance of Children Under 5 years aged Causes of Death, Bangladesh 2016

**Figure-3: Causes of death among children under five by age group**

Progress in Globally and Bangladesh Context

Globally, from 2000 to 2016 the under 5 mortality rates dropped by 47%; according to Progress Report SDG in 2018. Over the same period, the total number of under-5 deaths dropped from 9.9 million to 5.6 million. Even in the region facing the greatest health challenges, progress has been impressive (UN, 2018).

UN report says on Bangladesh; number of deaths drops from 5.32 lakh in 1990 to 1 lakh in 2017. Under-five mortality rate in Bangladesh is 32 per 1,000 live births, according to new mortality estimates released yesterday by UNICEF, World Health Organization (WHO), United Nations Population Division and the World Bank Group. The number of children dying under five has fallen dramatically from 12.6 million in 1990 to 5.4 million in 2017 (Star, 2018).

Conclusion

Children are considered as the future of a nation. So, the health of a nation depends on the health of its children

(Amartya Sen, 1998). Child mortality rate is a reflection of the care, health and nutrition status of children below the age of five years and also indicates the social, cultural, and economic progress in the country. To have an efficient nation with healthy citizens in 2021, it is very necessary to ensure survival and healthy improvement of all children, Goal-4 (CPD, 2007). Government of Bangladesh (GoB) should have to take into consider this issue very actively and in order to reduce the child mortality as per target must be ensured sustainability correlated program for urban and rural area and allocate double in health budget. Day by day increase public health expenditure what are they expects. Moreover, health costs are far more than income, which is not conducive to a poor family. In the most cases, high percentage of out-of-pocket expenditure out of the total health expenditure is associated with low financial protection. In 2014 out-of-pocket expenditure, as 67% of the health expenditure.

The concept of Under 5 Child Mortality: Experience from Bangladesh which cover its objective. Bangladesh trying to

achieve the MDG target 4: reduce under 5 mortality rates smoothly. Bangladesh also progress various challenges cause of child mortality. But day by day she has to overcome all the challenges to reduced child mortality.

Recommendation

Discussion of the above results proves that there has been a gradual decline in many cases of infant mortality which has been epidemic in size over the last four decades; Diarrhea, malaria, etc. However, Bangladesh needs to take various steps to protect children from death. Challenges and future priorities despite significant improvements in Bangladesh, some key challenges remain. In order to accelerate further progress, below necessary steps should be taken:

1. Food security confirmation;
2. Focus on mainstreaming nutrition interventions to reduce malnutrition;
3. Reduce early marriages and pregnancies;
4. Increase access to quality healthcare through immunization, empowerment of health workers, health care delivery, awareness campaigns;
5. Support for equitable distribution of health systems and services, especially for the low-income population and the marginalized;
6. Improve coverage of effective neonatal health interventions;
7. Ensuring efficient birth attendance and convenience delivery to reduce MMR;
8. Ensuring effective family and social protection as well as how swimming training can reduce the risk of death in children;
9. Improved access to water, sanitation, and hygiene.

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